

MAINTENANCE MATTERS



Decks and Balconies

Decks and balconies provide residents with great enjoyment and direct access to fresh air and the outdoors. Like all other building components they require routine maintenance, inspection and repair by qualified contractors and consultants to ensure durable performance.

What are Decks and Balconies?

This may sound like a simple question, but in fact decks and balconies are different. A deck is a horizontal surface exposed to the outdoors with a walking surface and located over an enclosed space below, so it is also a roof. A balcony is also a horizontal surface exposed to the outdoors with a walking surface, however, it typically projects from the building and it is not located over an enclosed living space below.



The upper deck is located over an enclosed space, while the balconies are not.



In addition to walking surfaces such as membranes, wood decking or concrete pavers, decks and balconies incorporate a variety of components including: guardrails, guardwalls, drains, gutters, soffits and vents.

What is a Deck or Balcony Membrane?

A deck or balcony membrane is a waterproof layer installed to protect the underlying structure from water leakage. The membrane may be exposed, acting as the actual walking surface, or may be covered with precast concrete pavers, wood planking or a concrete topping.

Maintenance Matters

This series of bulletins and companion videos is designed to provide practical information on maintaining residential buildings. Produced by BC Housing, in collaboration with Polygon and Canada Mortgage and Housing Corporation, this bulletin was prepared by a consortium of building envelope experts.

Different membranes are used depending on the type of deck or balcony construction, such as:

Liquid-applied urethane

- installed on concrete balconies to protect the reinforcing steel within the concrete from water penetrating at cracks and causing corrosion (rusting) of the steel, or on wood balconies to similarly protect the wood structure below
- used on wood decks and balconies that are built with a protected covering as an asphaltic urethane
- expected service life is usually ten years, however, with lower traffic and less exposure to the elements these membranes could last longer if regularly maintained

Sheet-applied vinyl

- typically used on wood-frame balconies
- most common material is reinforced polyvinyl chloride (PVC) sheeting, often simply called “vinyl” and installed in sections of standard widths with seams that are either heat-welded or glued
- expected service life is usually ten to fifteen years, depending on degree of exposure to sun, wetting, and wear and tear

Styrene butadiene styrene (SBS) bitumen modified torch-on

- a two-ply, much stronger membrane commonly used on decks or roof surfaces
- the membrane may be protected from damage with pavers or decking

An alternative method of deck construction, often seen in townhouses, is to have wood boards (without a membrane) spaced apart to allow water to drain between the boards and to the ground.

The most common wood for this type of construction is pressure treated lumber. Special care must be used in choosing appropriate metal hardware (for example, nails, screws, connectors, flashings) if the existing decking boards are being replaced with new treated wood

(see BC Housing’s Builder Insight bulletin No. 8: Compatibility of Fasteners and Connectors with Pressure Treated Wood for more information).

Why Must Deck and Balcony Membranes be Maintained?

Without proper maintenance, water may get in through holes and cracks in the membrane and joints that have separated. This can cause leaks to the building’s interior, damage to the wall assembly and cause rotting of the deck or balcony structure. Holes caused by sharp heels, table and chair legs, and damage produced by placement of heavy objects and careless use of tools may also increase the risk of water entry. Moreover, hot barbeques, spilled gasoline or solvents can actually melt vinyl membranes.

Residents in newly constructed wood-frame buildings should be aware that their building may be more susceptible to some structural movement over the first eighteen months of operation, as moisture from the wood dries out and the wood shrinks. During this time, the balcony or deck membrane may move or pull away from the wall, causing seams to fail and allowing water ingress at the edge of the membrane.

Shrinkage of the building frame can also cause the balcony slope to change, and ponding (standing water) at the wall to occur. While these matters are often taken into account during the building’s design and construction, some movement can still occur at a later date, potentially affecting the membrane. All these possible situations create a need for more diligent inspection within the first eighteen months of service.

Balconies and decks on wood-frame buildings are sensitive to water damage. If the membrane or other balcony or deck component fail, water can penetrate to the wood structure, where wood decay may occur. Interior ceiling finishes may also be damaged. Repairing this type of damage can be very expensive.

Other Deck and Balcony Maintenance Items

Guardrails and guardwalls

Guardrails and guardwalls are important safety features designed to prevent falls from balconies and decks.

Guardrails can be constructed from a combination of wood, metal and glass. One location where guardrails require special attention is at the bottom, where the guardrail may be fastened directly through the membrane to the horizontal surface of the balcony or deck. Water can leak through this vulnerable connection to the structure below. (Guardrails are best secured to a vertical face of the parapet or edge of the balcony, deck or walkway where the connection to the wall is not as vulnerable to water ingress.) Attention also needs to be paid to locations where the guardrail connects to the wall. Regularly inspecting and maintaining all guardrail connections, either through the membrane or to the wall, will reduce the likelihood of water penetration into the wall assembly or building structure.

Guardwalls are typically half-height walls that wrap around the perimeter of the balcony or deck. Depending on the type of construction, guardwalls are particularly susceptible to leaks at corners and intersections with the exterior wall (saddles). Regular inspection and maintenance attention is required including any sealants that may be used at these locations.



Guardrail connection to the wall can be a vulnerable point of water ingress.

Drains and gutters

Drains and gutters are important parts of a deck or balcony system that require regular maintenance. A critical yet easy maintenance item is to keep drains and gutters working properly by regularly cleaning balcony and deck floor surfaces to remove any dirt or debris, for example, leaves and twigs. This will ensure that drains and gutters are free-flowing and do not clog.

Proper functioning drains and gutters are especially important for decks and balconies with surfaces that slope to an internal floor drain connected to the building's storm drain, or to a drain-pipe that is extended to discharge to the ground or landscaping below. Often, internal floor drains have piping hidden inside the structure of the deck or balcony, making inspections and maintenance more difficult (or nearly impossible, in some cases, such as piping in concrete decks and balconies). Leaking drainpipes may go unnoticed for some time before the damage is apparent. It is also important to ensure that floor drains are not covered with objects such as carpets, plant pots or other items that will slow or stop water from flowing.

Keeping deck and balcony surfaces clear of dirt and debris is also important for continuous "edge wrap" drainage systems. Located at the perimeter of the deck or balcony, these systems drain the water into a continuous gutter. It is important that these systems remain free-draining to avoid clogs and water over-flow situations.



Staining on this deck membrane indicates ponding. Holes or punctures must be repaired as soon as possible to avoid water entering the structure when it rains.

Water drainage from decks and balconies with guardwalls is commonly achieved through area floor drains and scuppers (drains that allow water to pass from the surface of the deck or balcony through the wall) located at the base of the guardwall. Sometimes, the scupper drainage system is susceptible to ponding of water and membrane degradation around the scupper. Any area where water can pool may become a risk factor for moisture leaks. Report these situations to your maintenance manager as soon as possible.

Balconies with guardwalls may have overflow scuppers placed at an elevation higher than regular scuppers. This is to prevent excess water from remaining on the balconies if the regular scuppers become clogged. If water is draining from the overflow scupper, this is a sign that the conventional drainage is clogged or not working properly, and should be examined immediately. Decks with pavers use bi-level drains to allow for drainage of both the paver level and the protective membrane level.

Soffits and vents

There are a variety of vents associated with decks and balconies to provide for air circulation through enclosed spaces such as:

- soffit panels that cover the underside of balconies; typically made of vinyl or aluminum with perforations that allow air to circulate into the joist space
- round-shaped louver vents, sometimes found in the top and bottom of balcony and deck support columns

- strip vents, sometimes located on both sides of a guardwall or around the perimeter of the deck or balcony, or on the soffit to provide proper ventilation
- mechanical exhaust vents from kitchens, bathrooms or clothes dryers

All vents should be inspected and cleaned of debris or dirt and never covered, so that they continue to provide adequate ventilation. Problems can arise in some buildings where clothes dryer vents, installed on the underside of a balcony, become clogged with lint. In this situation the warm air can potentially back-up into the joist space located above the dryer exhaust vent leading to condensation. It can also clog nearby soffits and vents with lint. Keep dryer exhaust vents clear of lint build-up at all times.

What Maintenance Must be Performed on Decks and Balconies?

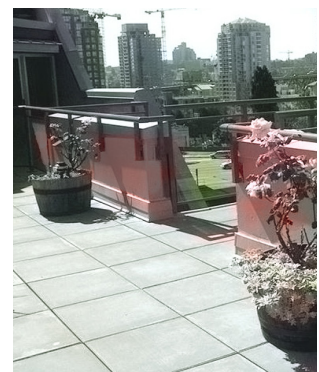
Building residents are usually responsible for cleaning and sweeping the surface of the deck or balcony as needed, while other inspection and maintenance items should be carried out by a trained professional. When cleaning the membrane, use common household cleaners containing plastic friendly ingredients. Never use solvents, alcohol, paint thinner or lacquer thinner to clean the membrane. These products may degrade vinyl and urethane membranes. Refer to the membrane manufacturer's literature for the recommended cleaning agents that can be safely used on their product.



Maintain drains free of obstructions, dirt or debris to ensure they are free flowing and to prevent water ponding.



The build-up of debris or dirt on the underside of the balcony limited the air flow through the vent, resulting in damage.



Deck with combination of guardwalls and guardrails.

Building residents or maintenance managers should not perform the decks and balconies membrane inspection themselves. A building envelope consultant has thorough knowledge of the many causes of membrane failures, deck and balcony problems, as well as the understanding of venting requirements and structural systems. If you have any doubts as to the proper approach for specific maintenance requirements, obtain professional advice from a building envelope consultant.

See the checklist of some common decks and balconies maintenance items on page 6.

How Often Must Decks and Balconies be Inspected and Maintained?

Deck and balcony membranes should be inspected at least every two years for both new and existing buildings.

If you live in a new building, inspect the condition of decks, balconies, railings and other related components, before the end of year one and year two to detect any possible problems stemming from wood shrinkage or structural movement of the building.

Inspect the condition and strength of the guardrails and guardwalls every two years. Scuppers should be maintained free of dirt and debris, and their attachment to the wall or the membrane should also be checked annually. Balcony and deck surfaces, including drains



Engage a building envelope consultant to develop a maintenance manual if your building does not have one.

and gutters, should be cleaned at least twice a year (or as needed) to remove leaves and other debris and to prevent clogging and potential water build-up problems.

Who Should be Called for Service?

For Inspection

Engage a building envelope consultant (an architect or engineer) to carry out inspections, and to develop a deck and balcony inspection and maintenance program, if you don't already have one. The report should identify the condition, causes of deterioration or failure, and whether localized repairs can be undertaken or, in some cases, if complete replacement is required. If the inspection report submitted by the building envelope consultant recommends replacing the membrane, it is best to evaluate the entire waterproofing, drainage, and venting systems. This includes the surrounding walls and guardrail connections. New building code requirements mean that more durable membranes must be used on deck surfaces, similar to those used on roof surfaces.

For Maintenance and Repair

Hire a contractor who specializes in the installation, repair, and maintenance of deck and balcony membranes and who is approved by the product manufacturer. Failure to utilize a qualified and trained contractor may result in faulty installation and may not be covered by the product's warranty.

Check for any applicable warranties on your current deck or balcony membrane. In many cases, deck and balcony components, including membranes, will include warranties. Different warranties may apply for materials, workmanship, design, and so on. A proper maintenance plan will include a record of all applicable warranties. It is important to review this record before undertaking the maintenance activities discussed here. Then update the maintenance plan accordingly after these activities are completed.

If the membrane is over fifteen years old, the risk of damage to the deck or balcony structure or the buildings exterior walls increases. It may be prudent to step up the

frequency of inspections to ensure ongoing acceptable performance. If the membrane needs replacement, a building envelope professional should be called in to develop the replacement program to ensure that it complies with all applicable building codes, structural requirements, and appropriate moisture-management principles.

When replacing guardrails or guardwalls, approval by a structural engineer must be obtained. Any damage to the deck or balcony membrane must be repaired prior to installing the new guards. A building permit may be required from the municipality for deck and balcony work.

Checklist of Common Deck and Balcony Maintenance Items

This list can be used by building residents to become familiar with some inspection and maintenance items. While some of the items can be carried out by residents, most should be coordinated by the building manager. In most cases, a building envelope consultant will need to be involved.

| Inspection/ Maintenance Item | Description | Suggested Action/Who Should be Involved |
|---|--|--|
| Dirt, leaves, twigs and moss | Lack of cleaning can cause clogs and blockages leading to moisture build-up or ponding that can damage the deck or balcony. | Residents could sweep, clean and remove debris on their decks and balconies. Gutters cleaning should be organized by the building manager. |
| Water ponding on the deck or balcony floor | Ponding could indicate that the drainage hole is blocked, there is not enough slope on the deck or balcony, or that sagging or settlement of the structure has occurred. | Residents should check drainage holes or scuppers and remove debris. If water is still ponding, the deck or balcony should be inspected by a building envelope consultant. The task should be coordinated by the building manager. |
| Clogged soffit and vent perforations | Keep vents clear of dirt and debris to ensure adequate ventilation is achieved. Clothes dryers that vent to the underside of a balcony can clog soffit and vent perforations with lint. | Contact your building manager to coordinate the clean up of soffits and vents. |
| Delamination or peeling of deck or balcony membrane from the wall | The membrane is debonding or pulling away from the wall. | Inspection, repair and replacement require the services of a qualified contractor, and some cases, may require inspection by a building envelope consultant. |
| Seam failure of the deck or balcony sheet membrane | The membrane has failed at the lap joint. In this case it may be possible to repair the joint and the balance of the membrane can remain. Early detection and repair of this type of defect can extend the life of the membrane, avoid water leakage and preserve the structure from major repair. | Inspection, repair and replacement require the services of a qualified contractor, and some cases, may require inspection by a building envelope consultant. |
| Corroded, loose, unstable guardrails, or bolts and steel connectors on guardwalls | These are safety hazards because they may fail when they are needed to prevent someone from falling. | Report conditions to building manager to contact a building envelope consultant for adequate inspection. |
| Concrete spalling and cracking, rusting of reinforcing steel | The presence of spalling, where pieces of concrete are flaking off or cracking on your deck or balcony, may be a serious problem and needs to be inspected by an expert. | Report to building manager to contact a building envelope consultant. |

A contractor specializing in gutter cleaning should be hired for this task. Often, the same contractor is hired for the exterior window cleaning and the gutter cleaning, as both maintenance items are performed at the same time.

Action Plan Tips

- Keep the deck and balcony surface free of debris and dirt, for example, leaves and twigs, to avoid drain clogs and potential water drainage problems.
- Hire a contractor to clean balcony and deck gutters annually (often done at the same time as window cleaning).
- Develop a deck and balcony inspection and maintenance plan (if your building doesn't have one) that includes a record of all applicable warranties. The record log should be updated whenever inspection or maintenance activities are completed.
- Engage a building envelope consultant to inspect decks and balconies every two years. This inspection should consider all balcony and deck components including membrane, railings, drainage system, soffits, vents, flashings, sealants, exterior windows and doors, connectors and hardware.
- Once the need for maintenance and repairs is identified, promptly hire a qualified contractor to carry out the work. This will minimize further damage.
- For new buildings, have the repairs done by the original supplier to maintain the warranty.

- Plan on replacing balcony or deck membranes after ten to fifteen years, and budget for this replacement program in your contingency fund.
- When the membrane system needs to be replaced, a building envelope consultant can develop a replacement program. This program will ensure that the new membrane complies with all applicable building codes, structural requirements, and appropriate moisture-management principles.

More Information

- › Building Enclosure Design Guide – Wood-Frame Multi-Unit Residential Buildings, available at www.bchousing.org
- › Wood Decks: Materials, Construction, and Finishing by Kent A. McDonald
- › CHOA Information Bulletins, available at www.choa.bc.ca
- › Hiring a Professional Engineer or Geoscientist, Engineers and Geoscientists BC, available at www.egbc.ca
- › Refer to your building's maintenance manual
- › Subscribe to receive Maintenance Matters bulletins at www.bchousing.org

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provisions requiring owners to mitigate and restrict damage to their homes and permitting warranty providers to exclude coverage for damage caused or made worse by negligent or improper maintenance. These apply to both new and building envelope renovated homes covered by home warranty insurance. Failure to carry out proper maintenance or carrying out improper maintenance either yourself or through qualified or unqualified personnel may negatively affect your warranty coverage. It is important for the property owner to read and review their warranty documents to understand how to file any claims and correspondence in the proper written form directly with the warranty company. Refer to your home warranty insurance documentation or contact your warranty insurance provider for more information.